Section 2

Hydrologic Maps/Figures

List of Hydrometric Stations

Stn No.	Name of river	Name of site	Latitude in ° ' "	Longitude in ° ' "	Elevation m.	Dr. Area sq. km.	Instru-ments	Start of records	End of records
150	Mahakali	Pancheshwor	29 26 45	80 15 30	430	12100	C,R,S	1/1/62	
170	Surnagad'	Patan near Baitadi	29 27 30	80 33 10	1110	188	C	01/01/66	--/04/88
240	Karnali River	Asara Ghat	28 57 10	81 26 30	629	19260	C,R,S	01/01/61	
250	Karnali River	Benighat	28 57 40	81 07 10	320	21240	C	01/02/63	
260	Seti River	Banga near Belgaon	28 58 40	81 08 40	328	7460	C,R,S	06/02/63	
265	Thulo Bheri	Rimna	28 42 30	82 17 30	-	-	C	18,06/72	
270	Bheri River	Jamu	28 45 20	81 21 00	246	12290	C,R,S	23/01/63	
280	Karnali River	Chisapani	28 38 40	81 17 30	191	42890	C,R,S	01/01/62	
286	Sarada Khola	Daradhunga	28 17 58	82 01 30	-	816	C,R,S	01/01/72	
290	Babai River'	Bargadha	28 25 20	81 22 10	192	3000	C,R	16/07/66	13/04/89
330	Mari Khola	Nayagaon	28 04 20	82 48 00	536	1980	C	01/01/64	
350	Rapti River	Bagasoti Gaon	27 54 00	82 51 00	381	3380	C,R,S	08/05/75	
360	Rapti River	Jalkundi	27 56 50	82 13 30	218	5150	C,R,S	08/04/64	
410	Kali Gandaki	Seti Beni	28 00 30	83 36 10	546	6630	C,R,S	21/02/64	
415	Andhi Khola	Dumrichaur Andhimuhan	27 58 20	83 35 20	543	476	C	06/04/64	
420	Kali Gandaki	Kotagaon Shringe	27 45 00	84 20 50	198	11400	C,R	15/04/64	
430	Seti River'	Phoolbari	28 14 00	84 00 00	830	582	C,R,S	01/01/64	27/08/92
439.8	Marsyangdi'	Gopling Ghat	27 55 35	84 29 42	320	3850	C,R,S	01/06/73	24/06/88
440	Chepe Khola	Garam Besi	28 03 41	84 29 23	442	308	C,R	20/11/63	
445	Budhi Gandaki	Arughat	28 02 37	84 48 59	485	4270	C,R,S	28/11/63	
446.8	Phalankhu Khola	Betrawati	27 58 25	85 11 15	630	162		24/04/69	
447	Trishuli	Betrawati	27 58 08	85 11 00	600	4110	C,R,S	01/04/67	
450	Narayani	Narayan Ghat	27 42 30	84 25 50	180	31100	C,R,S	10/02/62	
460	Rapti River	Rajaiya	27 26 30	84 58 15	332	579	C,R	01/01/63	
465	Manahari Khola	Manahari	27 33 00	84 48 10	305	427	C,R	13/06/63	

Stn No.	Name of river	Name of site	Latitude in ° ' "	Longitude in ° ' "	Elevation m.	Dr. Area sq. km.	Instru-ments	Start of records	End of records
470	Lothar Khola	Lothar	27 35 40	84 43 00	336	169	C,S	30/11/63	
505	Bagmati River	Sundarijal	27 46 30	85 25 40	1600	17	C,R	07/12/62	
530	Bagmati River	Gauri Ghat	27 42 30	85 21 00	1300	68		15/11/64	
536.2	Bishnumati Khola*	Budhanilkantha	27 46 49	85 21 32	1454	4		27/05/68	27/08/92
550	Bagmati River*	Chovar	27 39 40	85 17 50	1280	585	C,R,S	01/07/62	1980
570	Kulekhani Khola*	Kulekhani	27 35 10	85 09 30	1480	126	C,R,S	01/12/62	15/11/77
589	Bagmati River	Pandhera Dobhan	27 06 20	85 28 30	180	2700	C,R,S	28/01/79	
604.5	Arun River	Turkeghat	27 20 00	87 11 30	414	28200	C,R	23/05/75	
610	Bhote Koshi	Barhabise	27 47 10	85 53 20	840	2410		17/02/65	
620	Balephi Khola	Jalbire	27 48 20	85 46 10	793	629	C	25/12/63	
629.1	Indrawati River	Dolal Ghat	27 38 20	85 42 30	-	1225	C	1/9/72	
630	Sun Koshi	Pachuwar Ghat	27 33 30	85 45 10	589	4920	C,R	26/03/64	
640	Rosi Khola	Panauti	27 34 50	85 30 50	1480	87		17/10/63	
647	Tama Koshi	Busti	27 38 05	86 05 12	849	2753	C,R	14/01/70	
650	Khimti Khola	Rasnalu village	27 34 30	86 11 50	1520	313	C	06/04/64	
660	Likhu Khola	Sangutar	27 20 10	86 13 10	543	823	C	24/03/64	
670	Dudh Koshi	Rabuwa Bazar	27 16 00	86 39 50	460	4100	C,R	10/03/64	
680	Sun Koshi	Kampughat	26 52 30	86 49 20	200	17600	C,R,S	28/06/65	
690	Tamar river	Mulghat	26 55 50	87 19 45	276	5640	C,R,S	11/03/65	
695	Sapta Koshi	Chatara-Kothu	26 52 00	87 09 30	140	54100	C,R,S	01/01/77	
728	Mai Khola	Rajdwali	26 52 45	87 55 45	-	377	C,R,S	01/01/83	
795	Kankai Mai River	Mainachuli	26 41 12	87 52 44	125	1148	C,R,S	01/05/71	

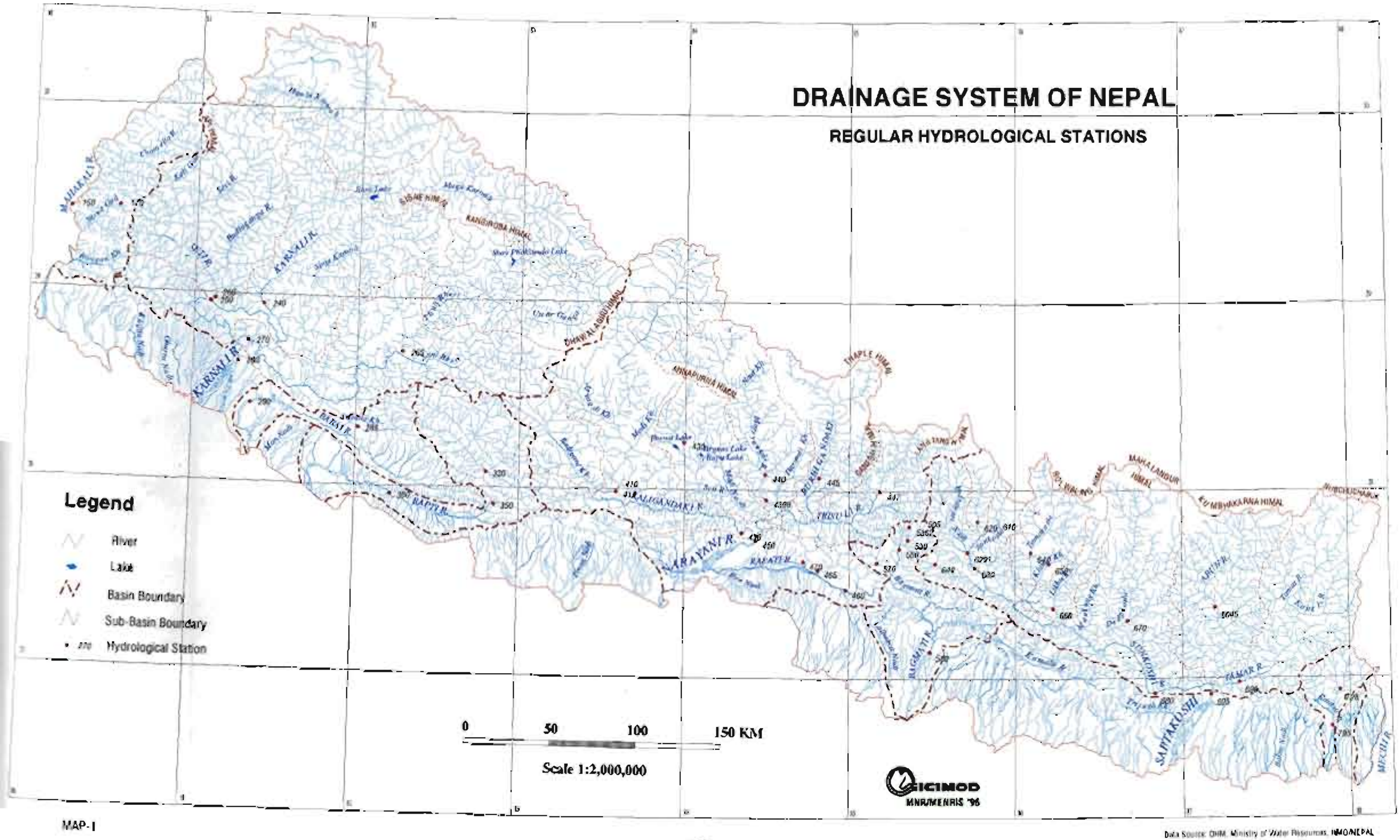
Total No. of Stations 47
* Stations Regularly Operating in the past

R = Water Level Recorder (total no.: 32)
S = Sediment Sampler (total no.: 23)
C = Cableway (total no.: 42)

All stations have a staff gauge
Data Source: DHM, Ministry of Water Resources, HMG/Nepal

DRAINAGE SYSTEM OF NEPAL

REGULAR HYDROLOGICAL STATIONS



MAP-I

Data Source: DHM, Ministry of Water Resources, HMG/NEPAL

HYDROGRAPHIC SCHEME OF RIVER KARNALI

(including all rivers having lengths L≥ 10 km.)

Scale

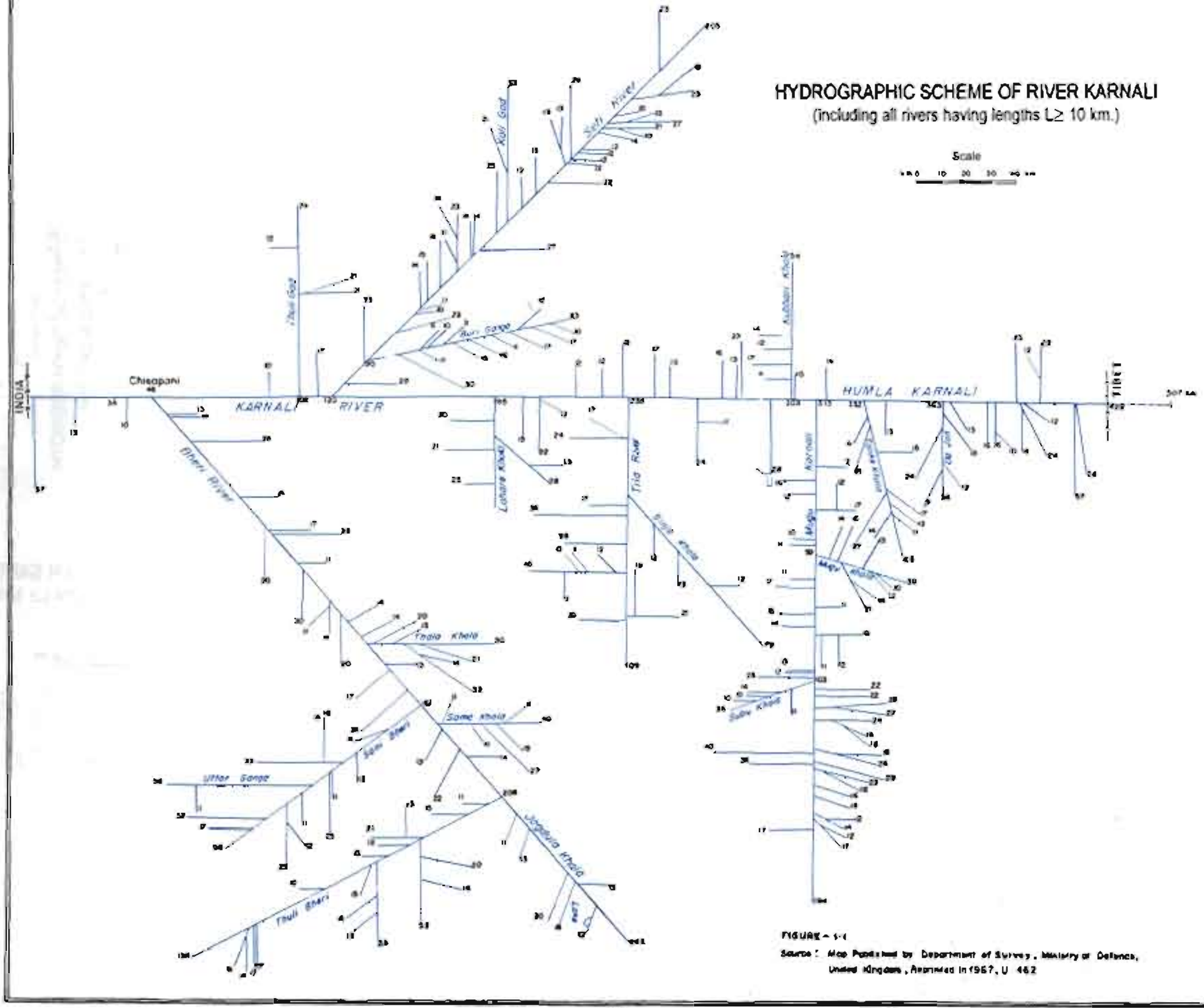
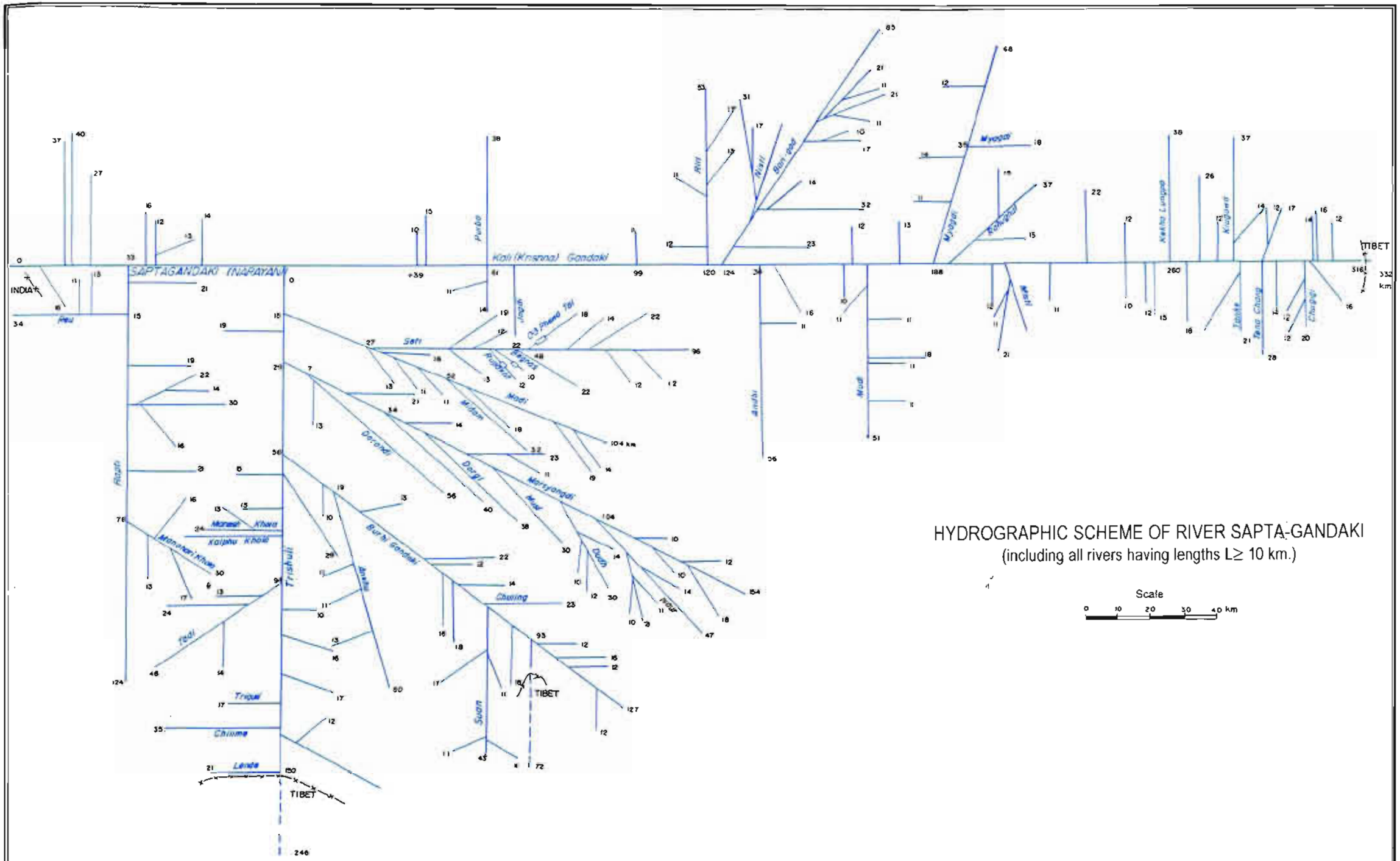


FIGURE – 5-1

Source : Map Published by Department of Survey, Ministry of Defence, United Kingdom, Published in 1967, U 462



HYDROGRAPHIC SCHEME OF RIVER SAPTA-GANDAKI
(including all rivers having lengths L≥ 10 km.)

FIGURE – 1·2

Source : Map Published by Department of Survey , Ministry of Defence, United Kingdom , Reprinted in 1967, U 462.

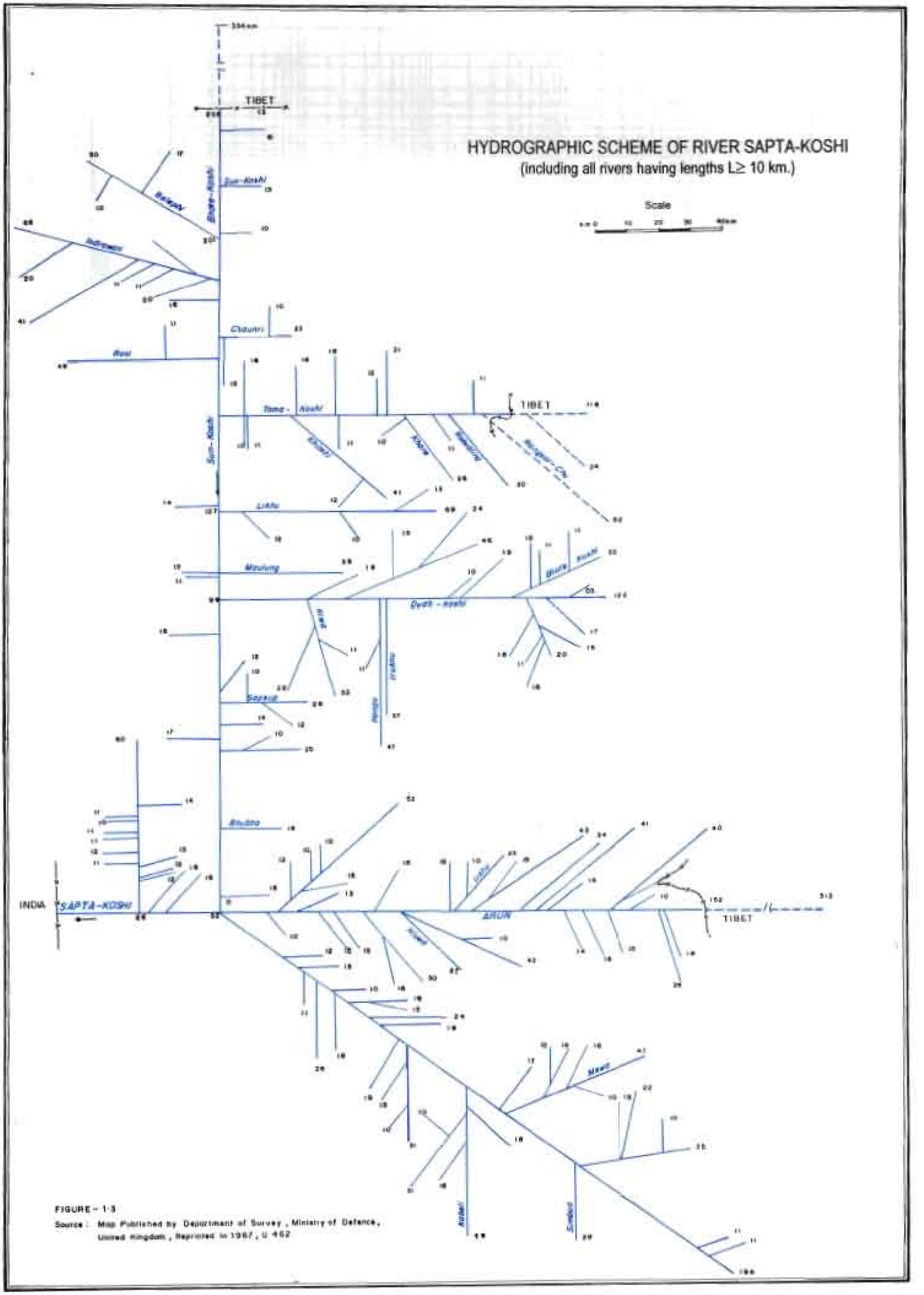


FIGURE - 1·3

Source : Map Published by Department of Survey, Ministry of Defence, United Kingdom, Reprinted in 1967, U 462

WATER AVAILABILITY FOR MAJOR RIVERS

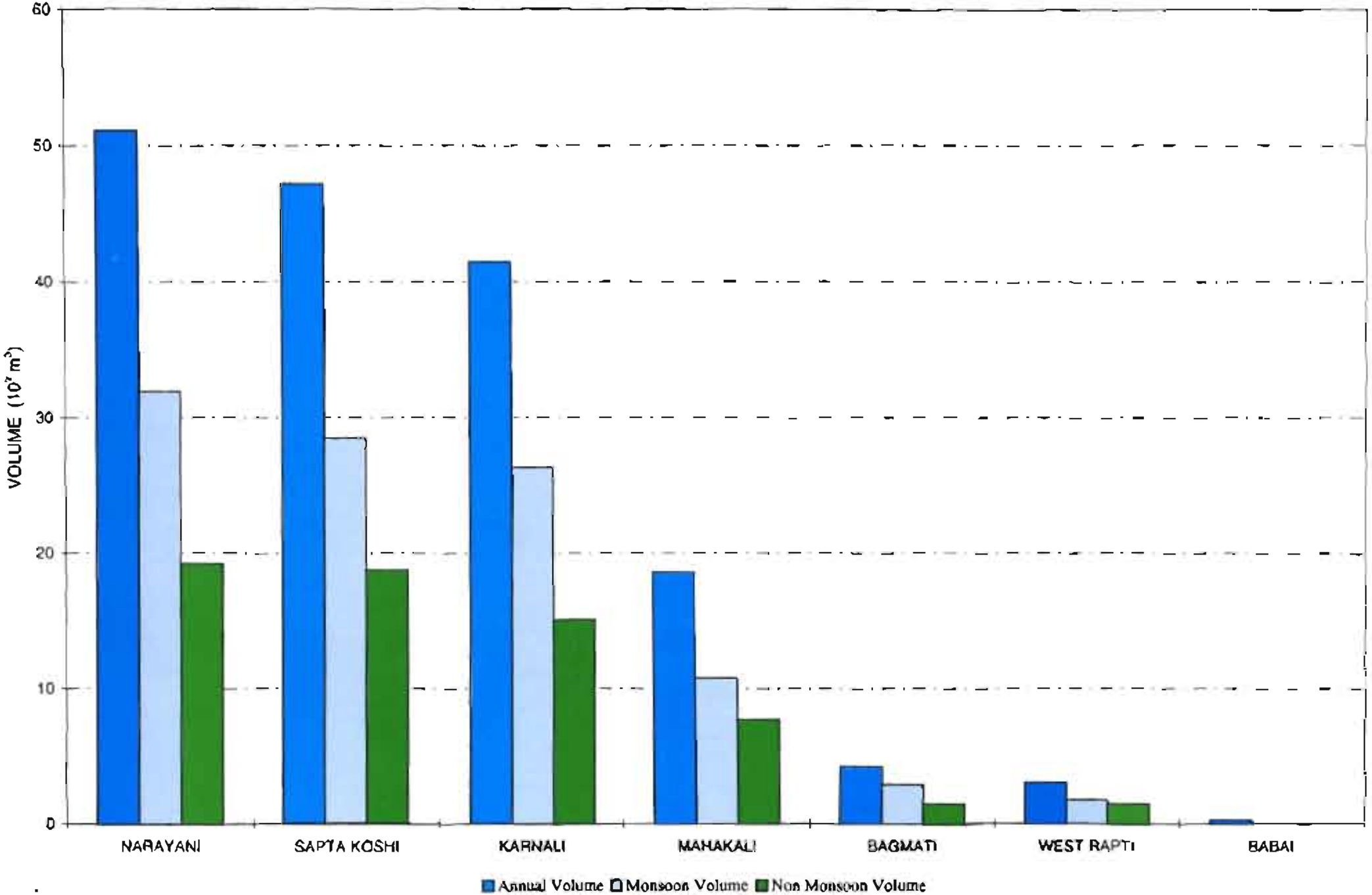
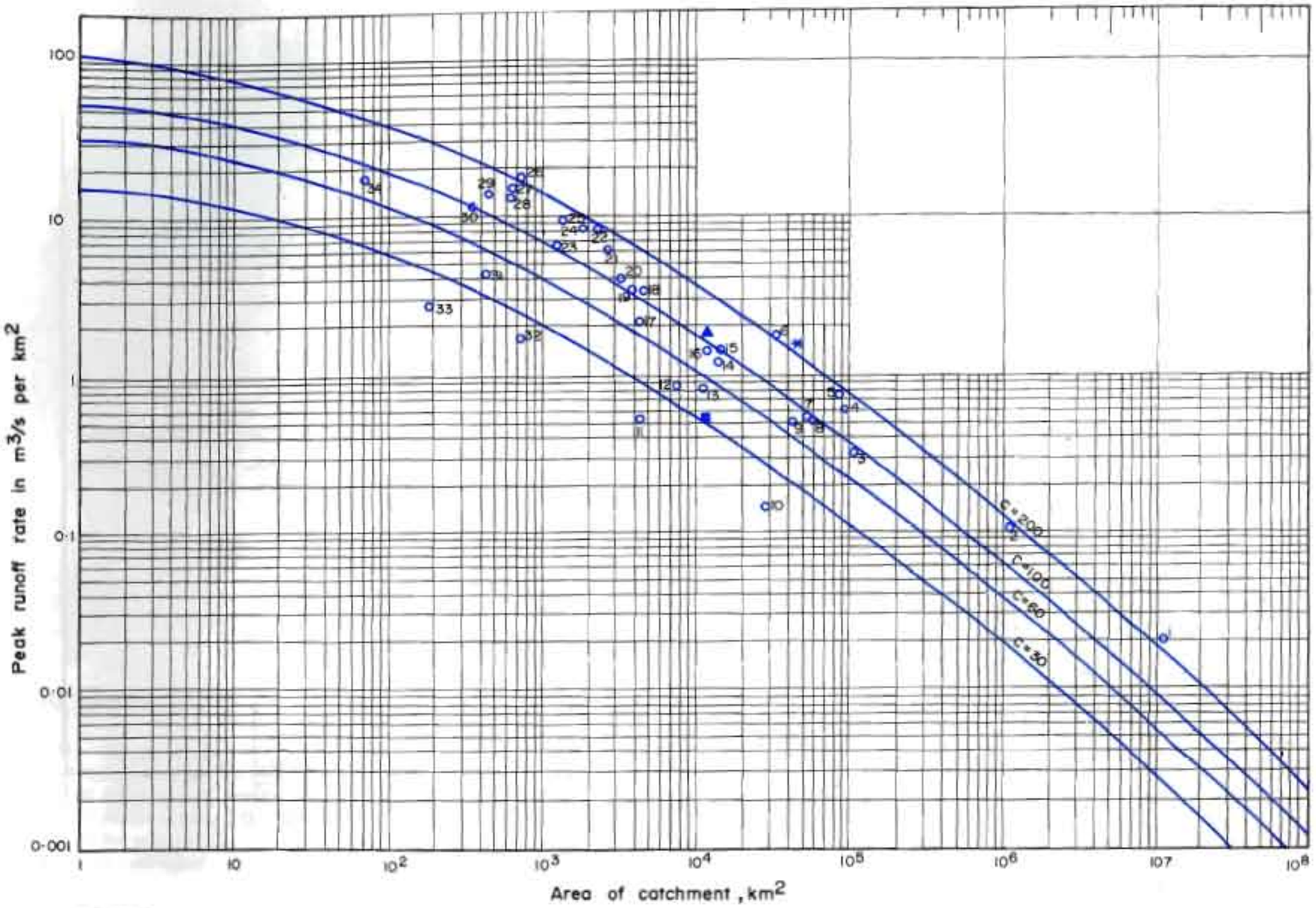


Figure -2

Source: Department of Hydrology and Meteorology, Ministry of Water Resources, HMG/Nepal.

COMPARISON OF FLOODS IN NEPAL AND SOME REGIONS OF THE WORLD



LEGEND

- ○ Recorded unusual flood discharges
- ▲ P M F Karnali project
- ✱ P M F Pancheswor Project
- ■ P M F Kali Gandaki Project

1. Congo at Ionga, Congo 2. Changjiane, China. 3. Tigris at Samarra, Iraq 4. Caroni at Guri, Venezuela. 5. Narmada, India 6. Jhelum at Mangla, Pakistan 7. Tigris at Eski, Mosul, Iraq. 8. Sapta Kashi at Chatara Kothu, Nepal 9. Karnali at Chisapani, Nepal 10. Arun at Turkeghat, Nepal 11. Trisuli at Betrawati, Nepal. 12. Pearl River, USA 13. Suriname at Brokopondo, Suriname 14. Greater Zab at Bekhme, Iraq 15. Diyala at Derbendikhan, Iraq 16. Lesser Zab at Dokan Dam, Iraq 17. Rapti at Jalkundi, Nepal 18. Cowlitz at Mayfield, USA 19. Cowlitz at Mossyrock, USA 20. Toni River, Japan 21. Bagmati River at Pandhera Dobhan, Nepal. 22. Shingu River, Japan. 23. Kankai Mai River, Nepal 24. Machhu, India. 25. Niyodo River, Japan 26. Ango at Ambuklao, Philippines 27. Angat, Philippines, 28. Tachuan, Formosa 29. Narayani at Narayan-Ghat, Nepal 30. Tenryu River, Japan 31. Manahari Khola at Manahari, Nepal. 32. Karadj, Iran. 33. Surnagad at West Patan, Nepal. 34. Kitakami River, Japan. (✱) PMF Karnali Project, Nepal (▲) PMF Pancheswor Project, Nepal (■) PMF Kali Gandaki Project, Nepal.

FIGURE-3

Sources: -Raudkivi, A.J., Hydrology, Pergamon Press, 1977, PP 288.

-DHM, Ministry of Water Resources, HMG/Nepal.

-Annual Disaster Review, 1993, Water induced Disaster Prevention Technical Centre, June 1994

-Mutreja, K.N., Applied Hydrology, Tata Mc Graw Hill, New Delhi, 1986, PP 746.

-Ministry of Water Resources, HMG/Nepal, Pancheswor Multipurpose Project, 1985; Karnali (Chisapani) Multipurpose Project, 1989 Kaligandaki 'A' Hydroelectric Project 1990.

FLOW DURATION CURVES FOR KARNALI (CHISAPANI)

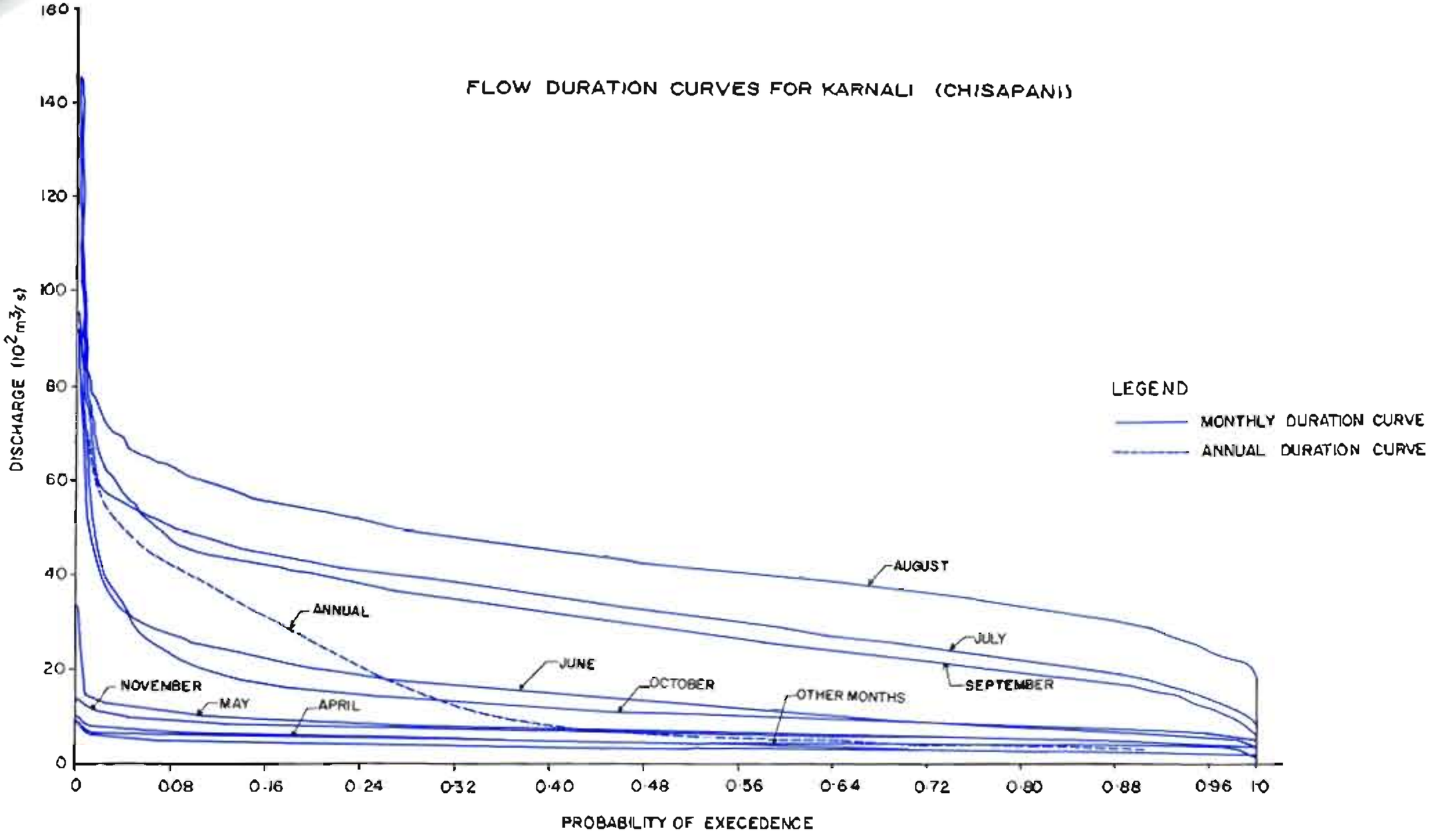


FIGURE – 4

Source. Ministry of Water Resources, HMG/Nepal, Karnali (Chisapani) Multipurpose Project Report, Dec 1989.

DRAINAGE DENSITY

(Including Length > 2km)

Density Legend

< 0.30	(km per sq.km)
0.30 - 0.31	(km per sq.km)
0.31 - 0.32	(km per sq.km)
0.32 - 0.33	(km per sq.km)
0.33 - 0.34	(km per sq.km)
> 0.34	(km per sq.km)

0 50 100 150 KM

Scale 1:2,000,000

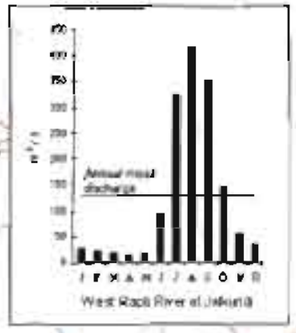
ICIMOD

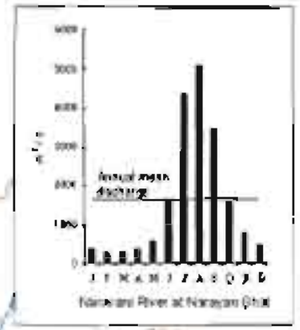
MNR/MENRIS '96

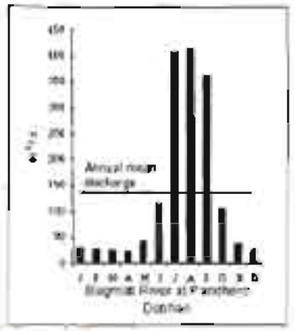
Data Source: Department of Hydrology & Meteorology, HMG, Nepal

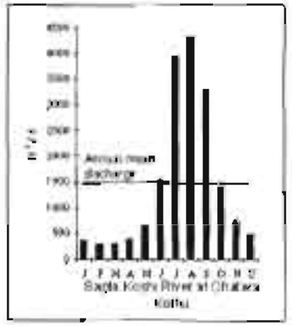
MAP-2

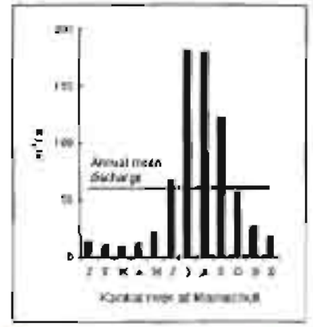
MONTHLY AVERAGE FLOW OF MAJOR RIVERS

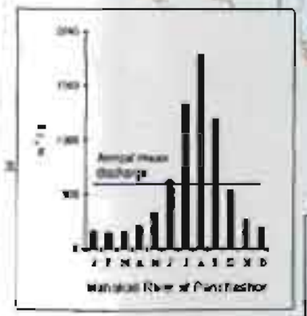


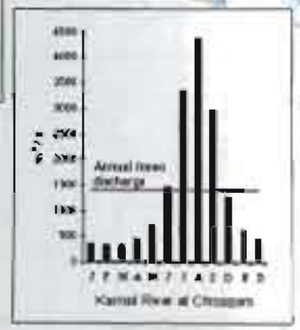


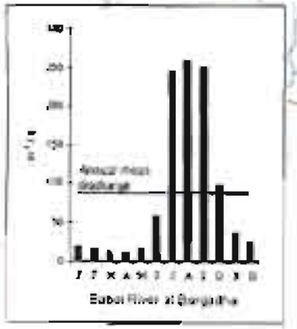












150

200

350

450

589

695

795

0 50 100 150 KM

Scale 1:2,000,000

FIGURE-5

Data Source: DHM, Ministry of Water Resources, HMG/NEPAL

ANNUAL MAXIMUM DAILY FLOW OF KANKAI MAI RIVER

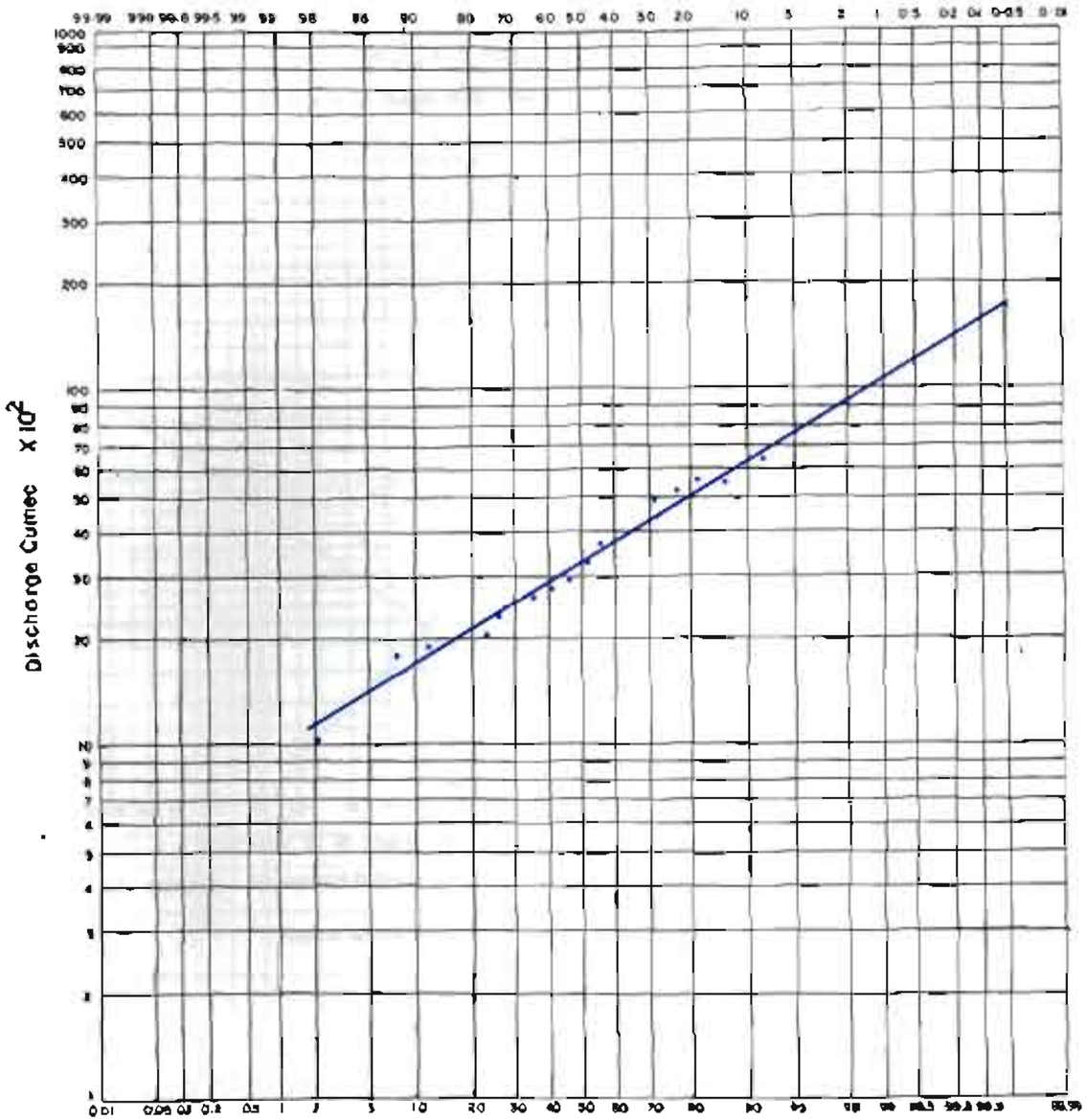


FIGURE - 6 1 KANKAI MAI RIVER AT MAINACHULI (Station No. 795)

Source. DHM, Ministry of Water Resources, HMG/Nepal

ANNUAL MAXIMUM DAILY FLOW OF ARUN RIVER

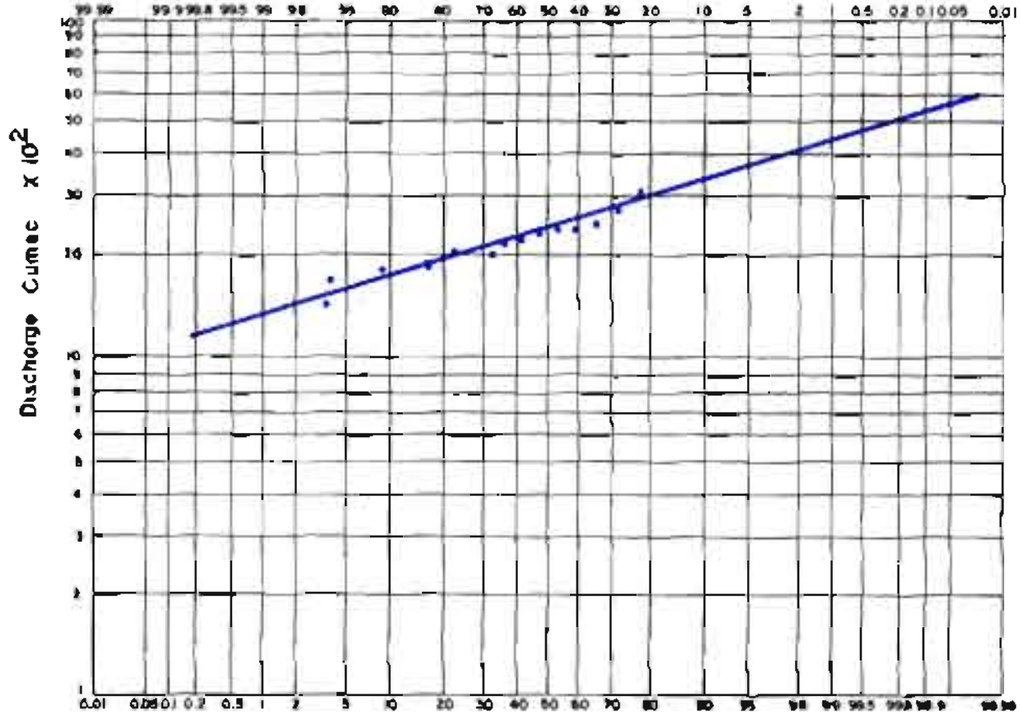


FIGURE - 6 2 ARUN RIVER AT TURKEGHAT (Station No. 604-6)

Source. DHM, Ministry of Water Resources, HMG/Nepal

ANNUAL MAXIMUM DAILY FLOW OF SAPTA KOSHI RIVER

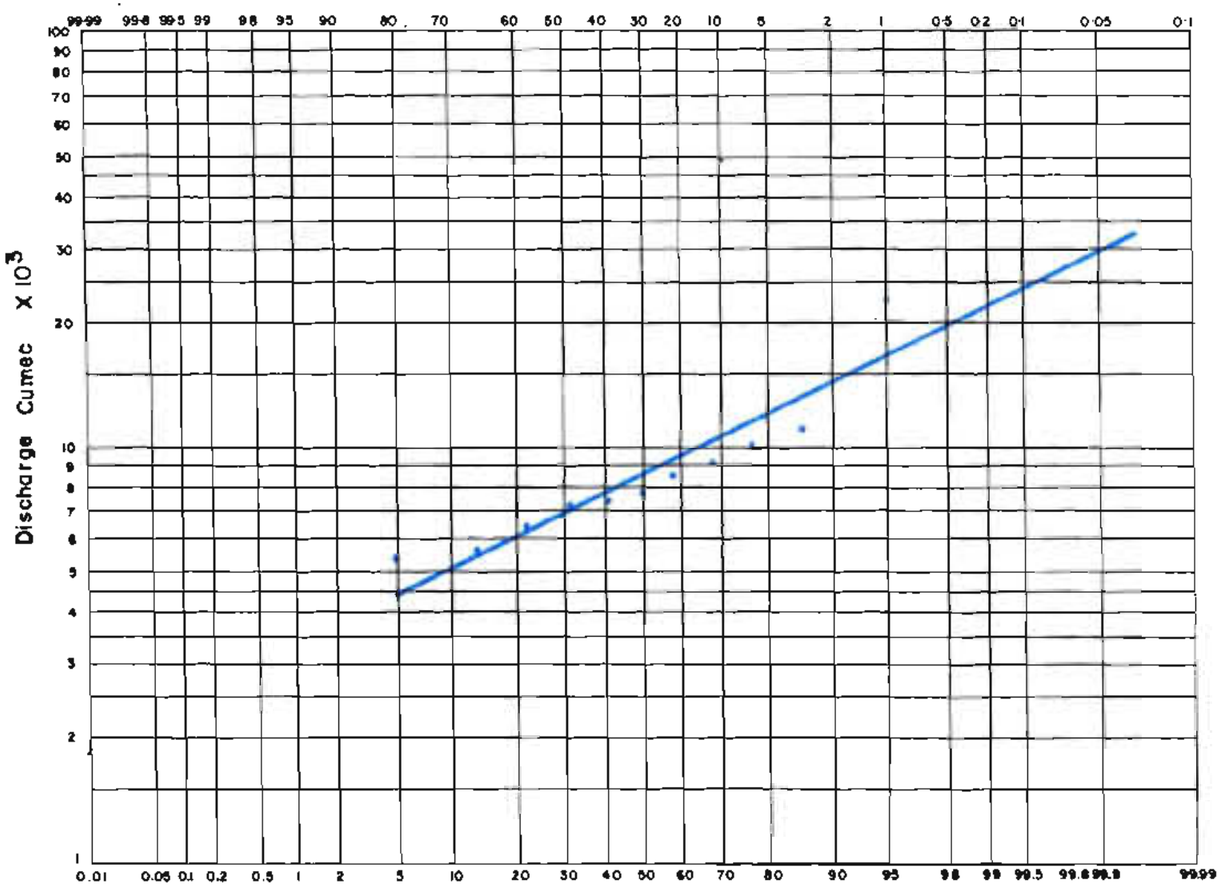


FIGURE 6.3 SAPTA KOSHI AT CHATARA –KOTHU (Station No.695)

Source: DHM, Ministry of Water Resources, HMG/Nepal

ANNUAL MAXIMUM DAILY FLOW OF BAGMATI RIVER

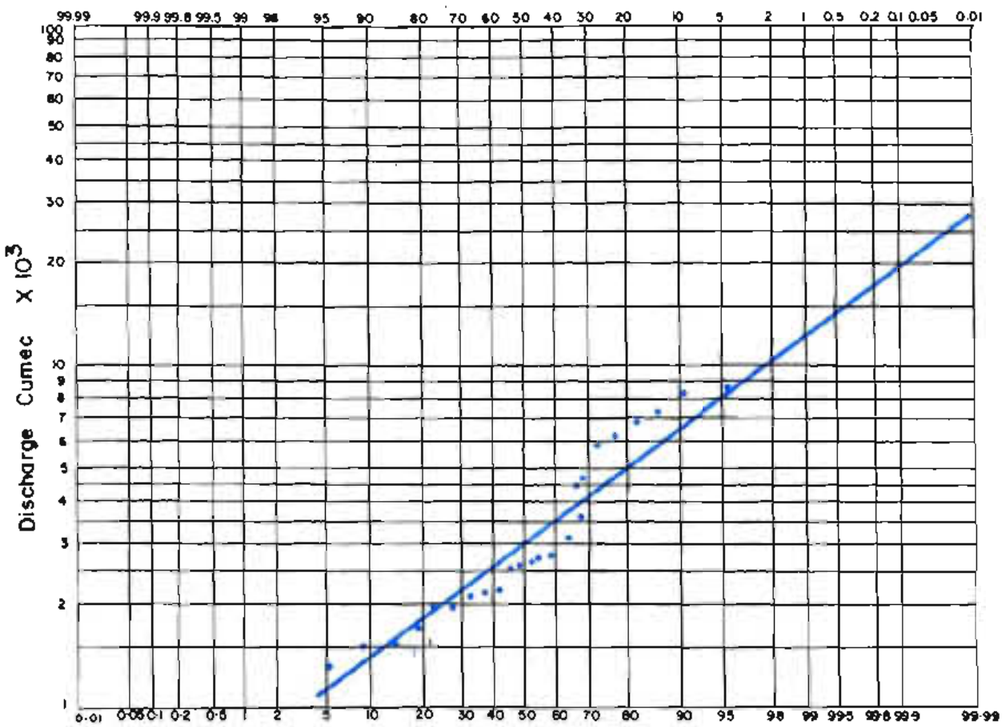


FIGURE - 6.4 BAGMATI RIVER AT PANDHERADOBHAN (Station No. 589)

Source: DHM, Ministry of Water Resources, HMG/Nepal

ANNUAL MAXIMUM DAILY FLOW OF MANAHARI KHOLA

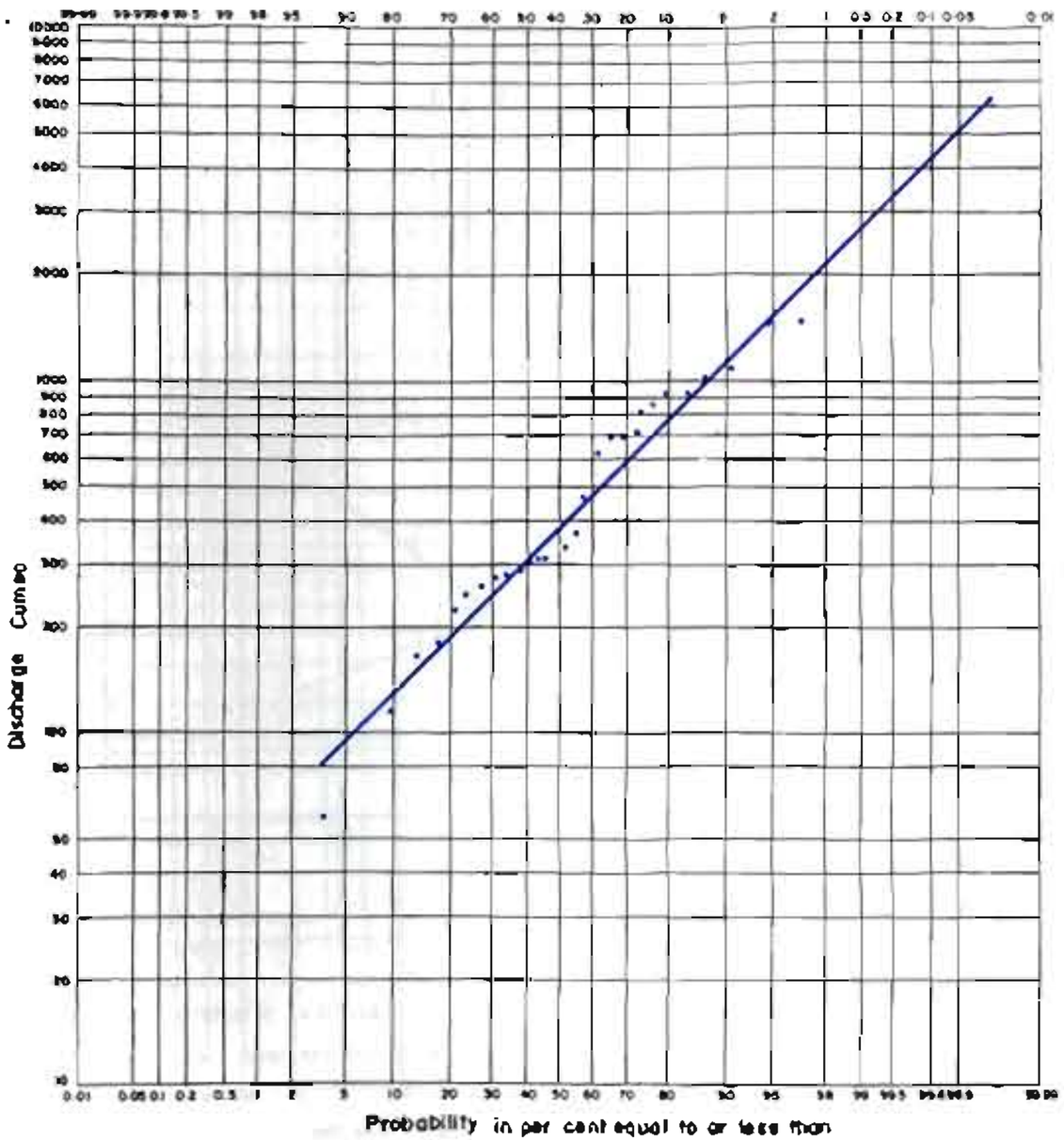


FIGURE - 6.5 MANAHARI KHOLA AT MANAHARI (Station No 465)

Source DHM, Ministry of Water Resources, HMG/Nepal

ANNUAL MAXIMUM DAILY FLOW OF NARAYANI RIVER

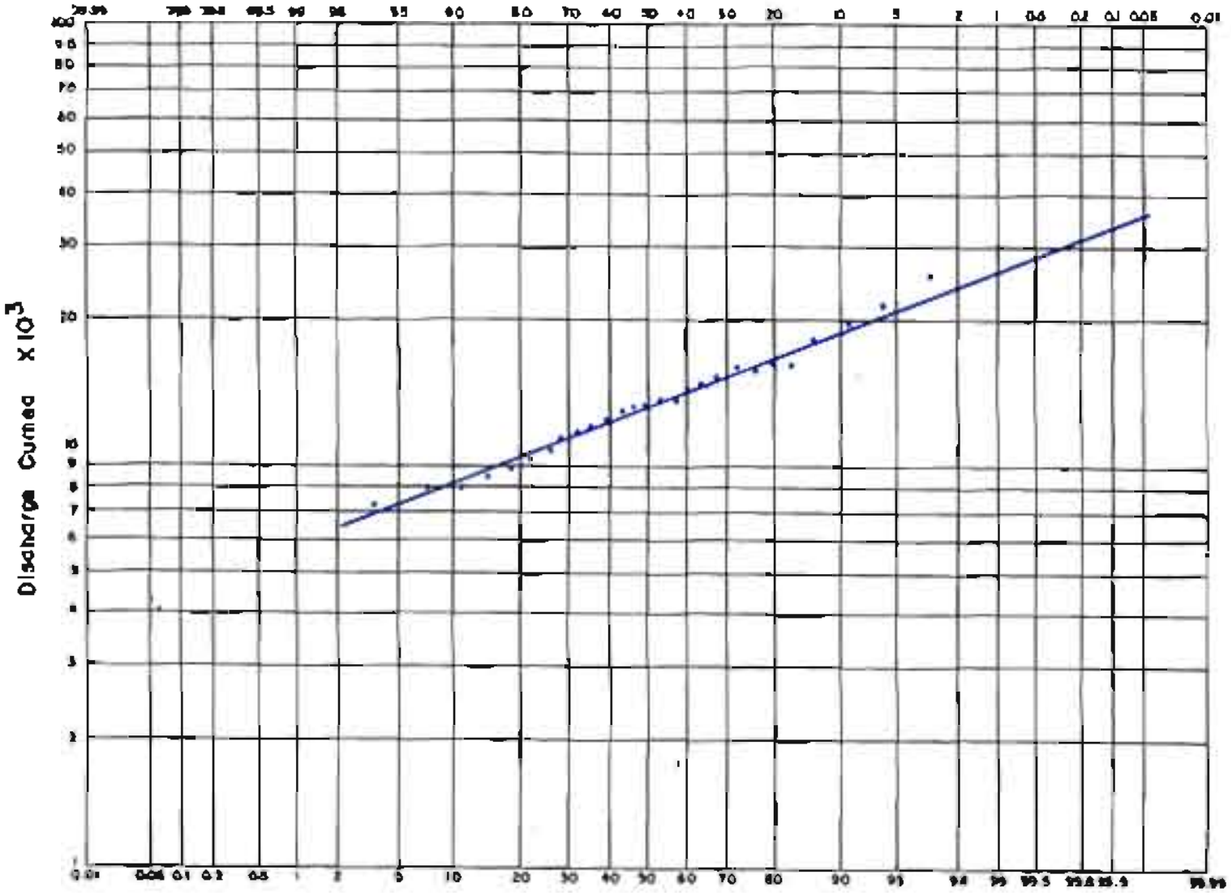


FIGURE 6.6 NARAYANI RIVER AT NARAYANGHAT (Station No. 450)

Source: DHM, Ministry of Water Resources, HMG/Nepal

ANNUAL MAXIMUM DAILY FLOW OF RAPTI RIVER

Probability in per cent equal to or greater than

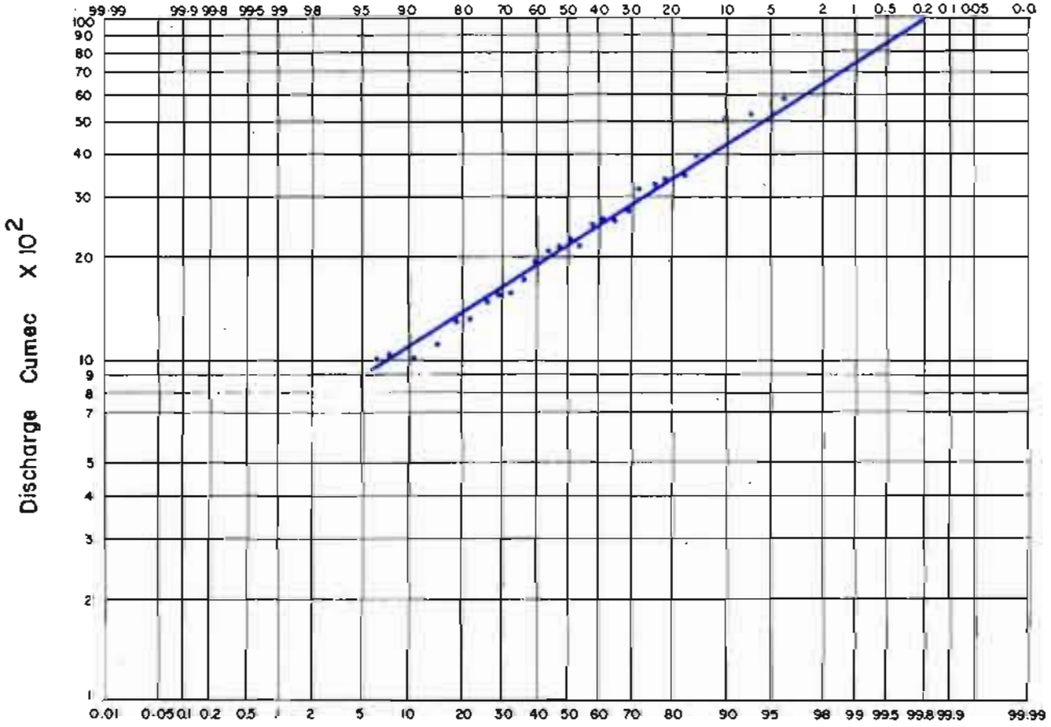


FIGURE - 6.7 RAPTI RIVER AT JALKUNDI (Station No. 360)

Source: DHM, Ministry of Water Resources, HMG/Nepal

ANNUAL MAXIMUM DAILY FLOW OF BABAI RIVER

Probability in per cent equal to or greater than

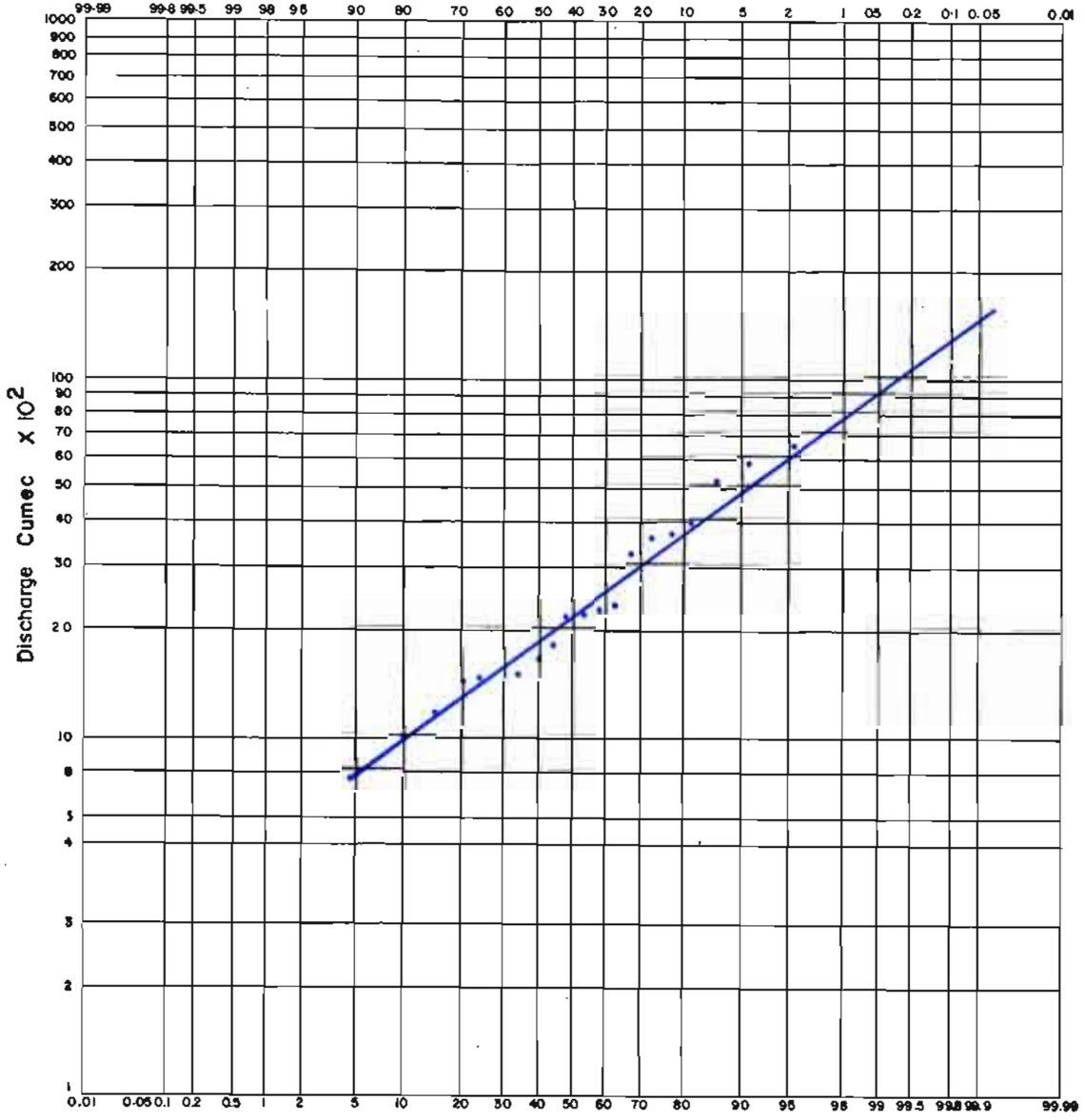


FIGURE - 6.8 BABAI RIVER AT BARGADHA (Station No. 290)

Source: DHM, Ministry of Water Resources, HMG/Nepal

ANNUAL MAXIMUM DAILY FLOW OF KARNALI RIVER

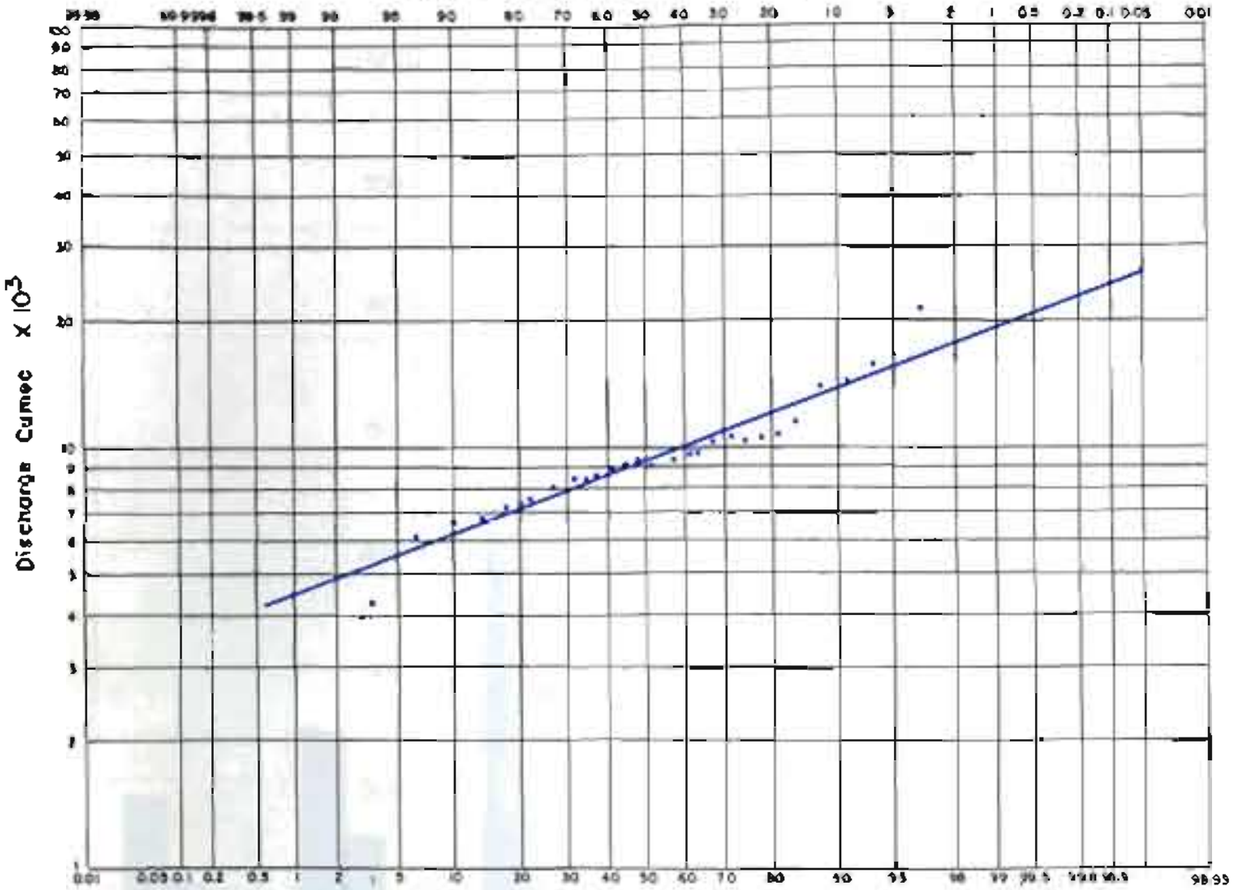


FIGURE 6.9 KARNALI RIVER AT CHISAPANI (Station No 2801)

Source : DHM, Ministry of Water Resources, HMG/Nepal

ANNUAL MAXIMUM DAILY FLOW OF SURNAGAD

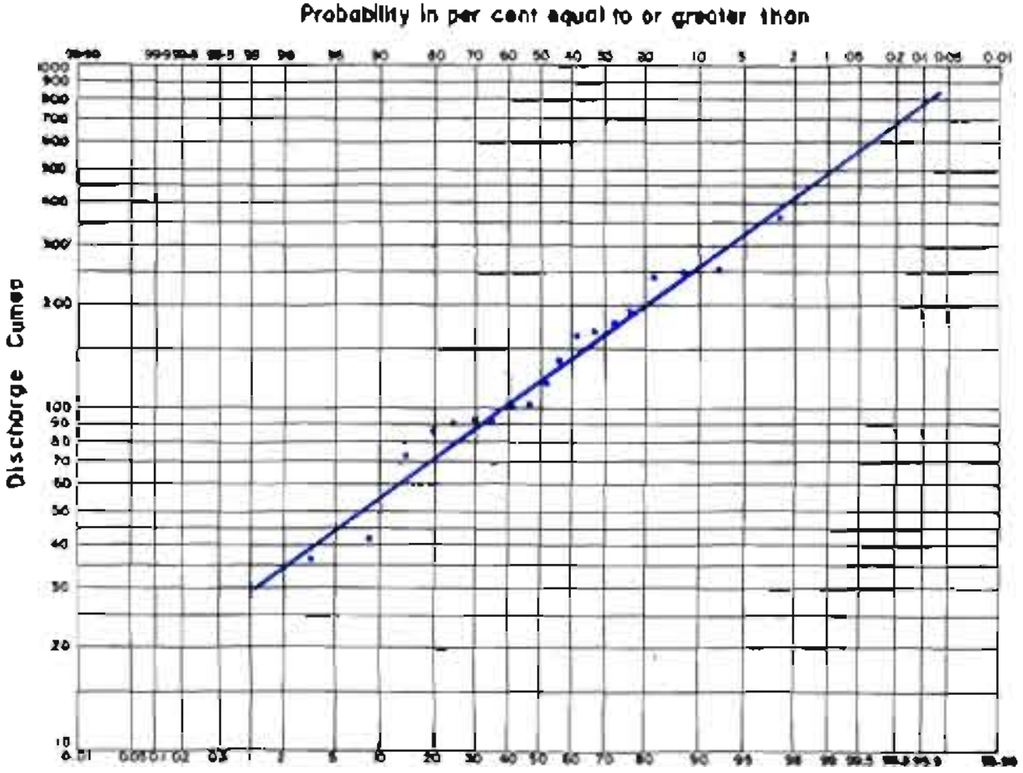


FIGURE-6 10 SURNAGAD AT PATAN NEAR BAITADI (Station No 170)

Source : DHM, Ministry of Water Resources, HMG/Nepal

MONTHLY DISTRIBUTION OF FLOW FOR DIFFERENT TYPES OF RIVER

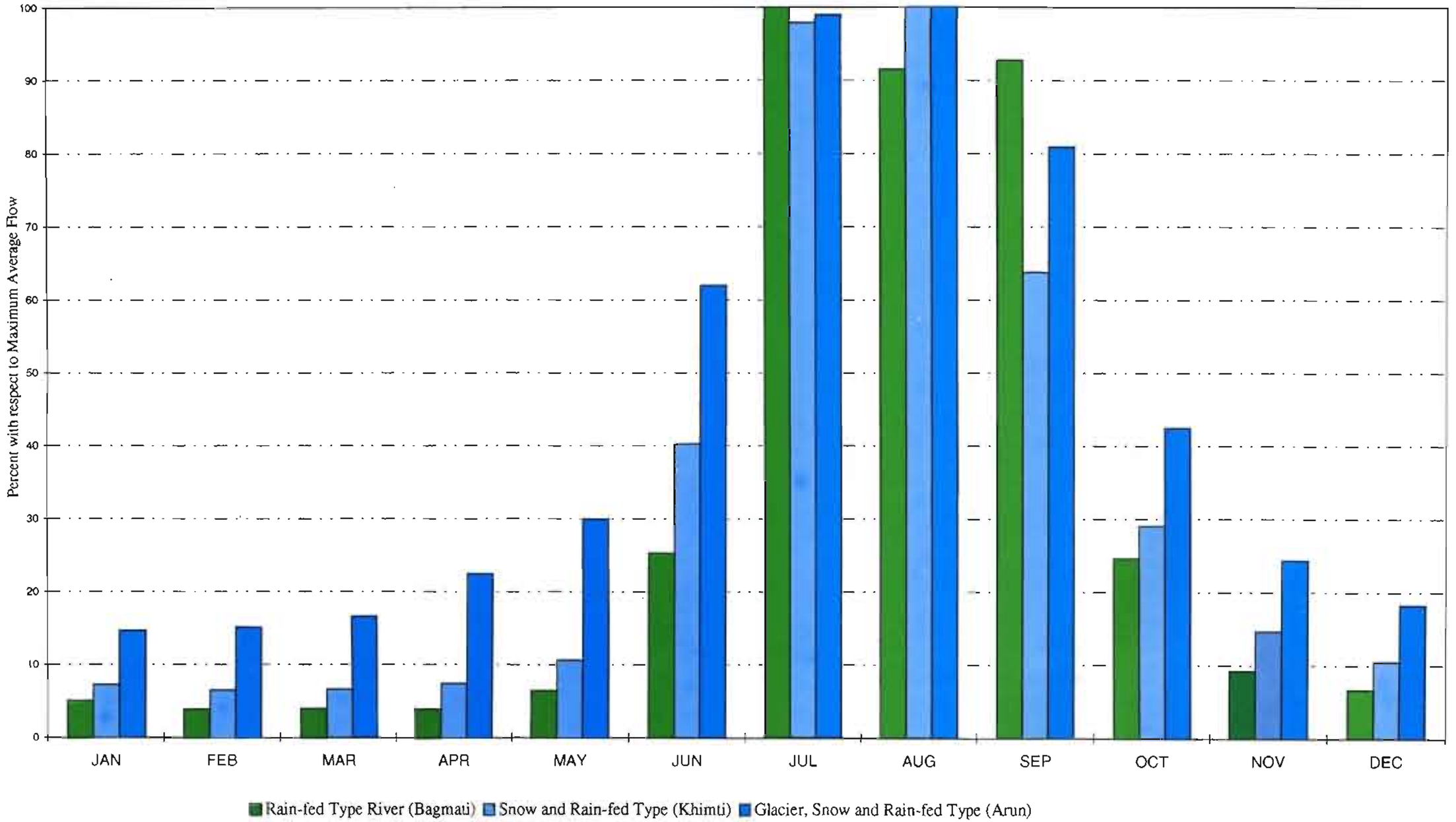


Figure -7

Source: - Department of Hydrology and Meteorology, Ministry of Water Resources, HMG/Nepal.
- Khimti Khola Hydroelectric Project Feasibility Study, Ministry of Water Resources, HMG/Nepal. Table 3.5.1, Vol.I, Apr.1993

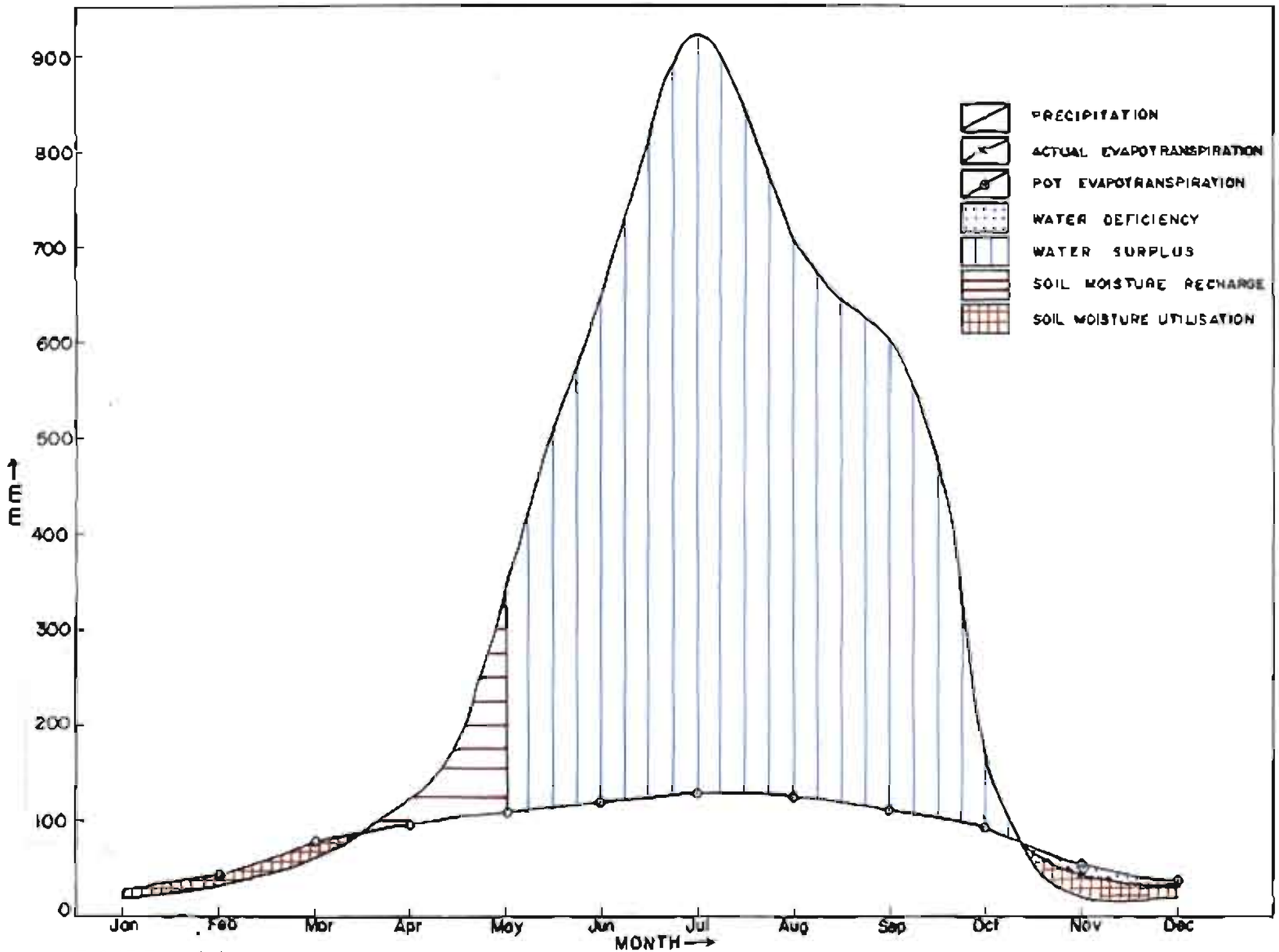


FIGURE 8(c) WATER BALANCE OF POKHARA

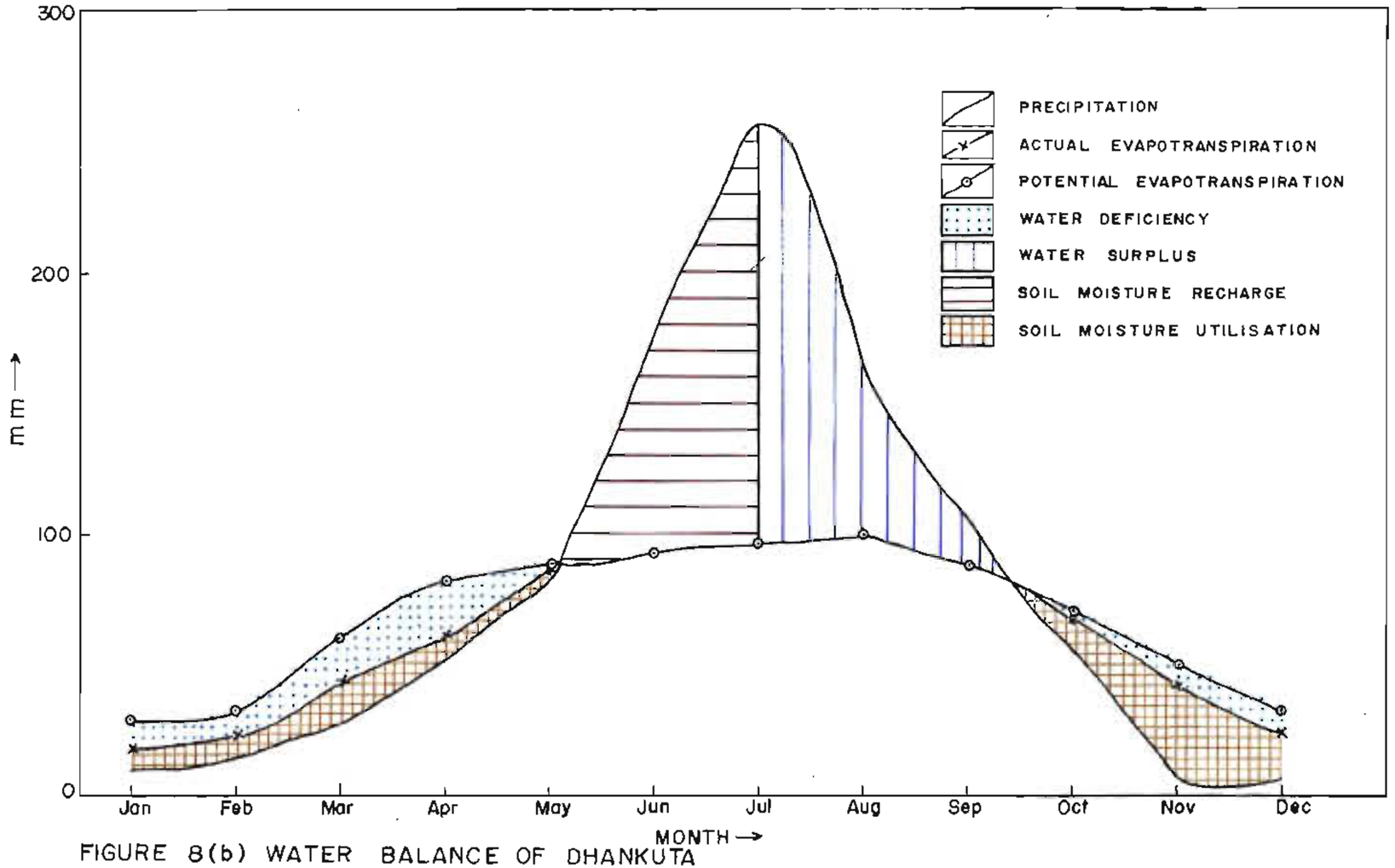


FIGURE 8(b) WATER BALANCE OF DHANKUTA

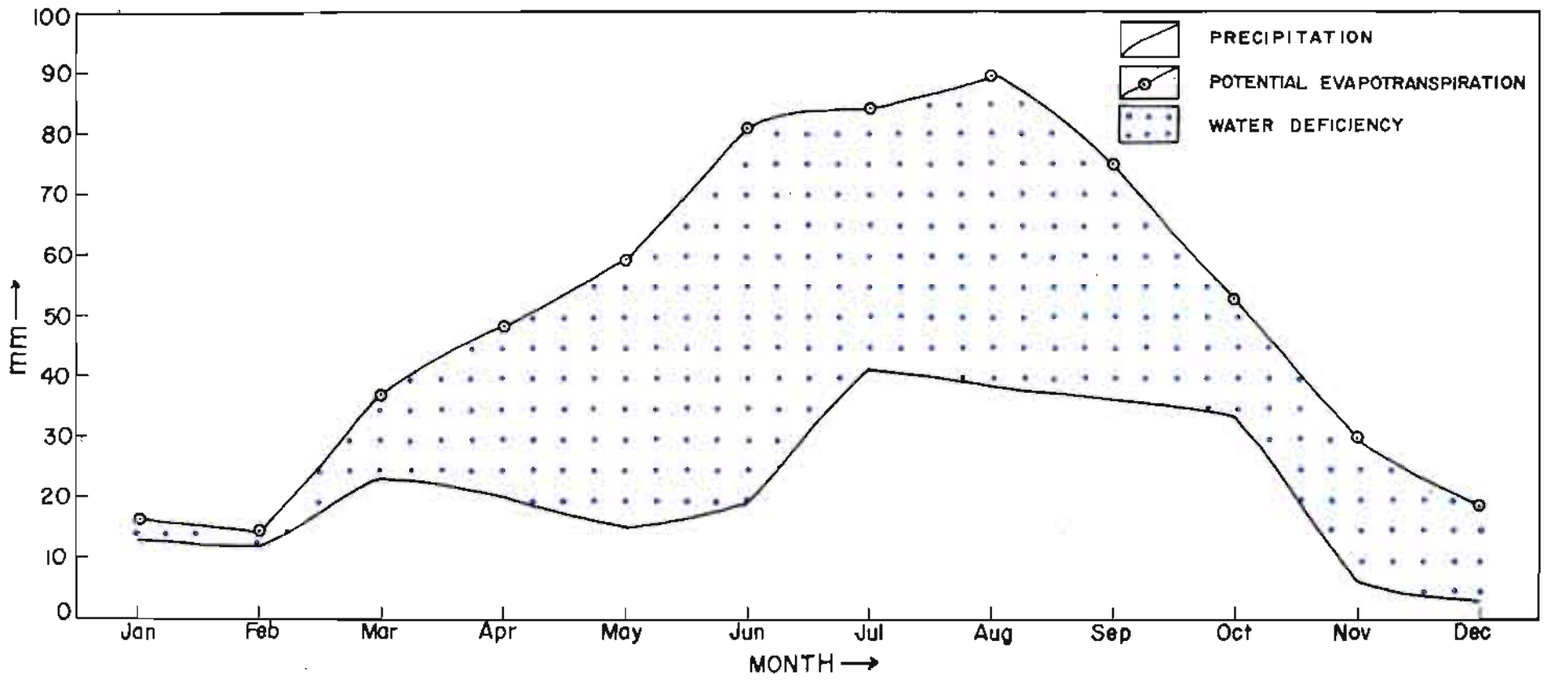


FIGURE 8(C) WATER BALANCE OF JOMSOM